Permutations Review **Name** _____

Calculate each of the following:
a) 10 P2
b) 7 P7
c) 5 P3
d) 12 P5
e) 3 P1

1.) Carlos has homework to do in math, chemistry, and English. How many ways can he choose the order in which to do his homework?

2.) The menu for a banquet has a choice of two types of salad, five main courses, and three desserts. How many ways can a salad, main course, and dessert be selected to form a meal?

3.) How many ways can six different books be arranged on a shelf if one of the books is a dictionary and it must be on an end?

4.) Each question on a five-question multiple-choice quiz has answer choices labeled A, B, C, and D. How many different ways can a student answer the five questions?

5.) Consider making a four-digit I.D. number using the digits 3, 5, 8, and 0.

a.) How many I.D. numbers can be formed using each digit once?

b.) How many can be formed using each digit once and not using 0 first?

c.) How many can be formed if repetition is allowed and any digit can be first?

d.) How many can be formed if repetition is allowed but 0 is not used first?

6.) 10 students are to be lined up for lunch. How many different lines can we form?

7.) 128 tennis players are entered in a tournament. If the top 32 players are seeded, how many ways could we assign the seeds to 32 different players?

8.) 100 Senators are being considered to chair the 17 committees in the US senate. How many different ways could the chairpeople be selected, assuming that no one chairs more than 1 committee?

9.) 8 friends go to the movies and Mike insists on being third in line to get tickets. If his wife always stands in front of him in line, how many ways can the 8 friends line up at the ticket window?

10.) The same 10 students wish to go to lunch. How many ways could we line up 5 of them, send them to lunch and then line up the remaining 5?

11.) A bookshelf contains 3 math, 3 science and 3 social studies textbooks.

a.) If all of the books are the different, how many ways can the books be arranged on the shelf ?

b.) How many ways can the books be arranged such that the books of the same type are together?

c.) If all of the math books are identical, all of the science books are identical, and all of the social studies books are identical, how many ways can the books be arranged on the shelf?

12.) Carlino's Restaurante offers three kinds of salads, twelve kinds of entrees, and four kinds of desserts. How many different 3-course meals can be ordered?

13.) How many permutations are there for the word elementary?

14.) How many different ways can 15 children be sent to the library in groups of four?

15.) You have ten new library books to display on a shelf. How many different ways can they be arranged?

16.) Seven flute players are performing in an ensemble:

a.) The names of all seven players are listed in the program in random order. What is the probability that the names are in alphabetical order?

b.) After the performance, the players are backstage. There is a bench with only room for four to sit. How many possible seating arrangements are there?

c.) What is the probability that the group of four players is sitting in alphabetical order?